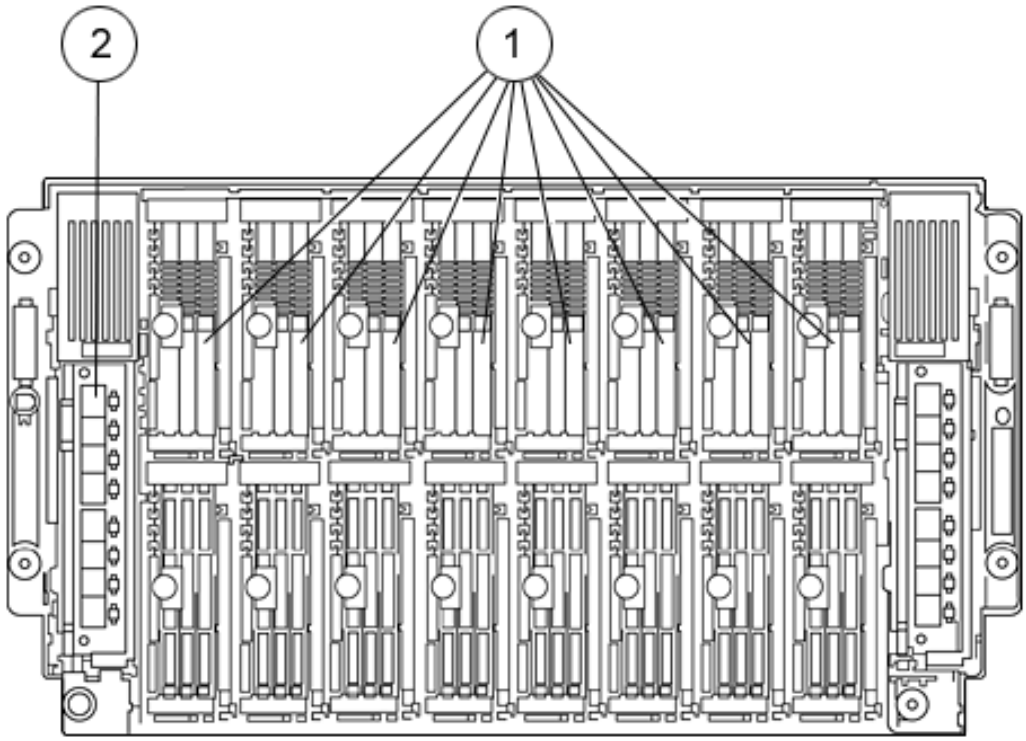
Overview

ProLiant BL30p Server Blades Installed in Server Blade Enclosure



1. ProLiant BL30p Server Blades (16)
2. ProLiant BL p-Class interconnects (2) (patch panel 2 shown)

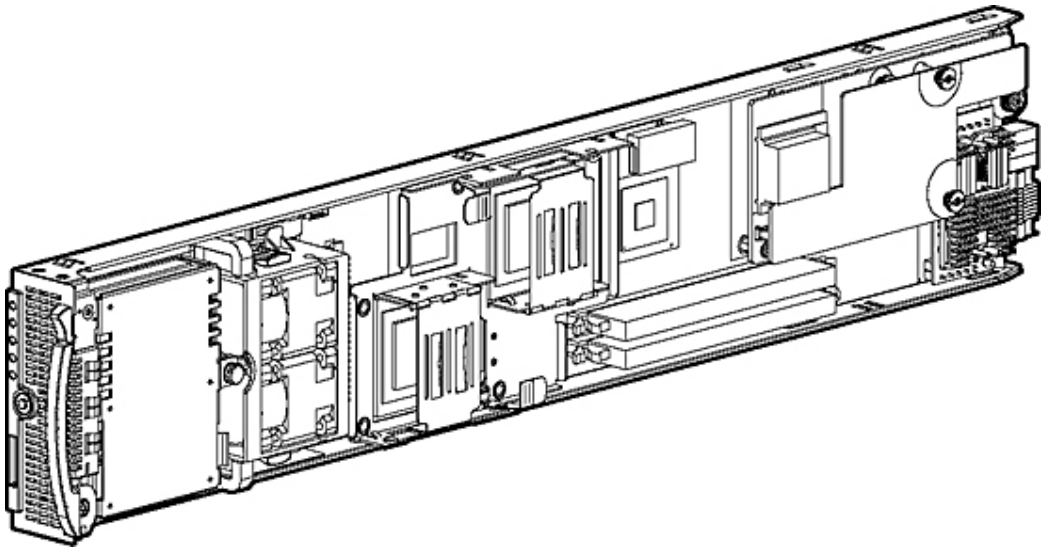
What's New

- ProLiant BL30p -- A new high density, dual-processor capable server blade for the ProLiant BL p-Class
- An enhanced, fully backwards-compatible server blade enclosure featuring support for the new BL30p series server blades and all current and future BL20p series and BL40p series blades
- New enclosure with enhanced backplane components features Integrated Light-Out (iLO) management cable consolidation
- iLO provides new feature for automatically assigning static IP addresses for blades
- New dual power input option kit allows support for two power enclosures on mini bus bars

At A Glance

- **Maximum density ProLiant BL30p server blade**
  - Up to two Intel Xeon 3.2-GHz/533-MHz with 2MB L3 cache processors with Hyper-Threading Technology
  - ServerWorks GC-LE chipset
  - 1024-MB PC2100-MHz Registered ECC DDR memory (1 x 1-GB), expandable to 4-GB, flex memory supports interleaved and non-interleaved memory configurations
  - Integrated Lights-Out (iLO) Advanced Pack with new static IP bay configuration feature
  - Two (2) NC7781 PCI-X Gigabit NICs (embedded)
  - One 10/100T NIC (embedded) dedicated to iLO management
  - Supports up to two optional small form factor ATA 60-GB hard drives
  - BIOS-Enhanced RAID for Linux enables both primary and secondary hard drives to be bootable
  - Dual-Port Fibre Channel Adapter (2-Gb) option for SAN connectivity
  - BL30p plugs vertically into blade sleeve and sleeve plugs into 6U blade enclosure
  - Local I/O cable attaches to front of blade and provides two USB ports, one video port, one iLO port and serial port
  - Integrated Access Tool for blade management and enhanced server blade documentation including Best Practices and Common Procedures guides
  - Up to 96 BL30p blades fit in 42U rack in non-redundant power configuration; up to 80 BL30p blades fit in 42U in full power redundant configuration
- **ProLiant BL p-Class Server Blade Enclosure with Enhanced Backplane Components**
  - Updated to support the new BL30p blade and be fully compatible with all current and future BL20p series and BL40p series blades
  - Blade iLO signals are physically consolidated to an RJ-45 port on the server blade management module
  - Option kit available for field upgrade of backplanes to existing, deployed blade enclosures
  - Each server blade enclosure is 6U and holds up to 16 ProLiant BL30p server blades (BL30p blade sleeve is required for each pair of BL30p blades installed)
  - Interconnect options for network signal routing include GbE Interconnect Switches, GbE2 Interconnect Switches with optional Fibre Channel pass through, Patch Panels or Patch Panel 2 with Fibre Channel pass through
- **ProLiant BL p-Class Power Enclosure**
  - BL p-Class rack-centralized power enclosure holds hot-plug power supplies
  - Use BL p-Class sizing tool to determine power and cooling requirements based on your desired configuration: http://h30099.www3.hp.com/configurator/calc/Power%20Calculator%20Catalog.xls
  - 3 phase power enclosure highly recommended for BL30p deployments
  - BL p-Class power enclosure not needed if using facility -48VDC ± 10% (DC option kit required)
- **ProLiant BL p-Class Power Distribution**
  - Carries power from the power enclosure(s) to the server blade enclosures
  - Three power distribution choices:
  - mini bus bars (support up to 3 blade enclosures)
  - scalable bus bars (support up to 5 blade enclosures)
  - power bus box (supports a single blade enclosure)
  - New dual power input option kit allows support for two power enclosures on mini bus bars
- BL p-Class server blades, server blade enclosures, interconnects and power enclosures protected by a limited three year warranty with optional service uplifts available. **NOTE:** All ATA hard drives offered by HP carry a one year warranty regardless of the base system in which they are installed.
  NOTE: Power requirements for a ProLiant BL p-Class system: 200V - 240V AC, 30 amp or facility DC -48V ± 10%.

Overview



ProLiant BL30p Server Blade

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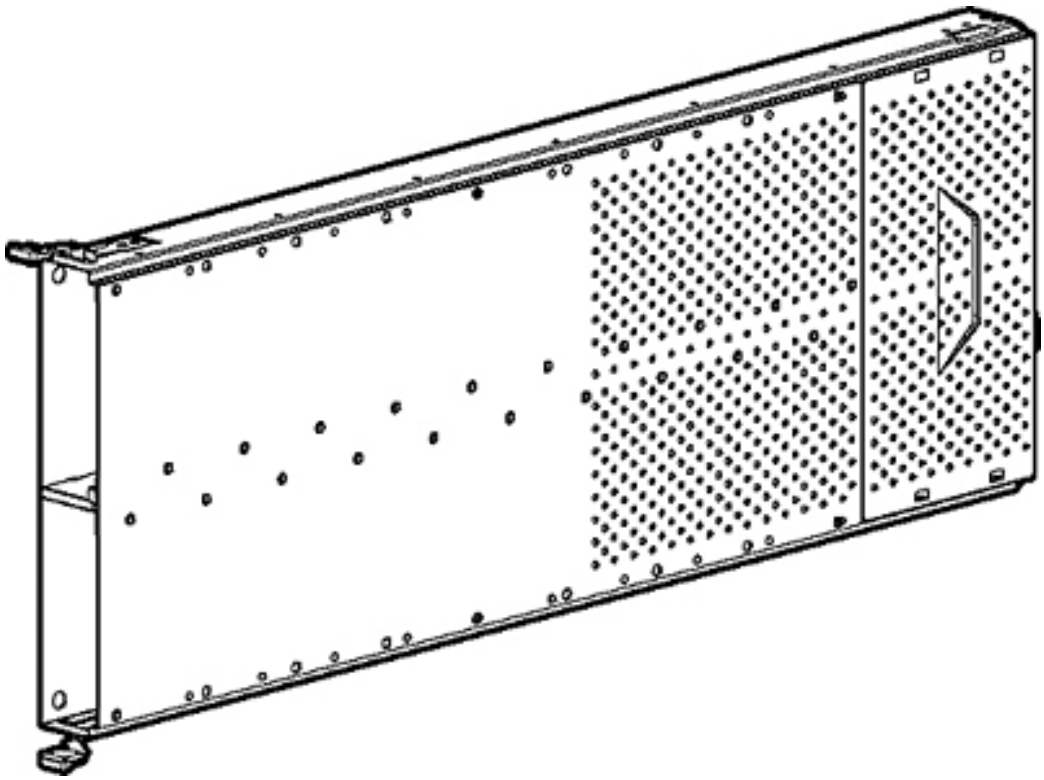

ProLiant BL30p Blade Sleeve (holds 2 BL30p blades)

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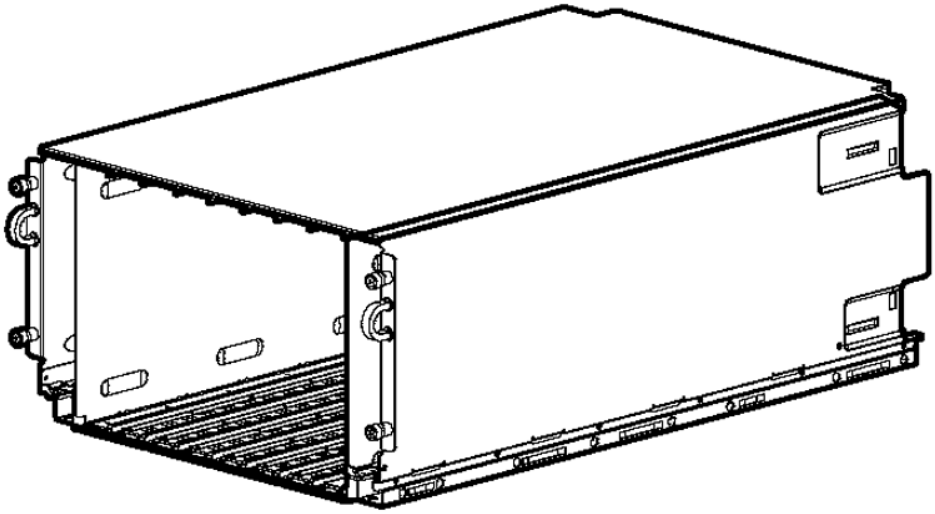

BL p-Class Server Blade Enclosure with enhanced backplane components

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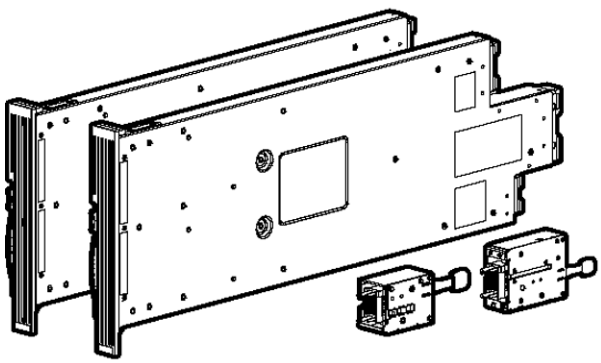
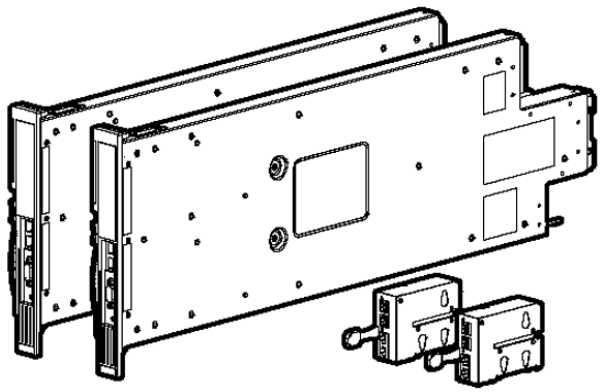


Patch Panel (shown) or
Patch Panel 2

OR



GbE Interconnect Switch (shown) or GbE2 Interconnect Switch
(fiber- or copper-based)

BL p-Class Interconnects

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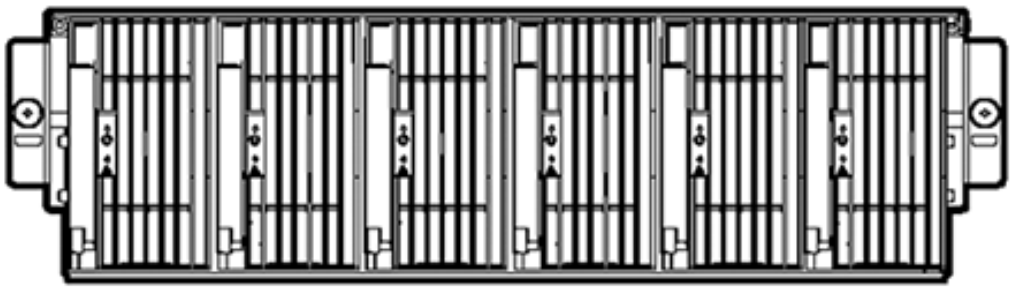

BL p-Class power enclosure(s) and power supplies (three phase recommended)

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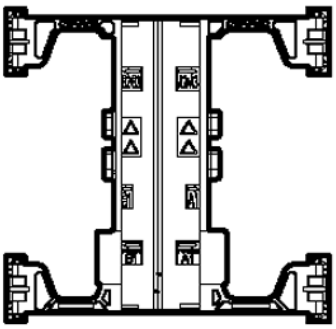
OR

Facility DC

Overview



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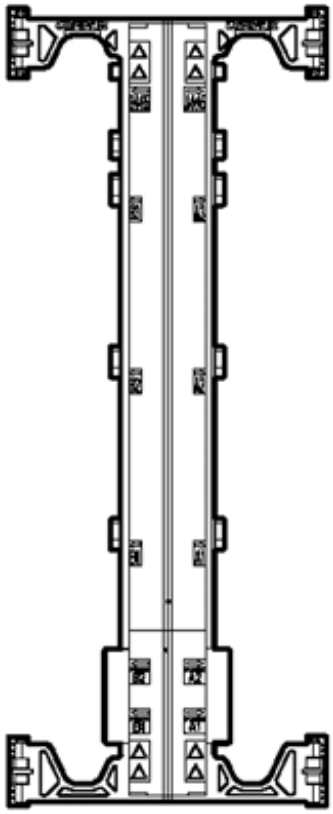

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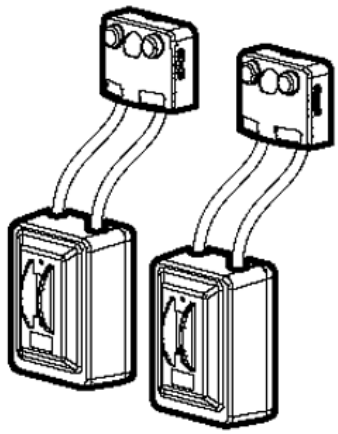


Mini bus bars | Scalable bus bars | Bus boxes

BL p-Class power distribution

Configuration Steps

- For a complete ProLiant BL30p blade solution, do the following:

1. Select desired model, configuration and quantity of ProLiant BL30p server blades

   PLUS

2. Determine how many BL30p blade sleeves are required. Each BL30p blade sleeve holds two BL30p server blades and one server blade enclosure holds up to eight sleeves.

   PLUS

3. 3. Determine how many BL p-Class Server Blade Enclosures with enhanced backplanes are required. Each blade enclosure with enhanced backplanes can hold up to 16 ProLiant BL30p server blades.

   NOTE: ProLiant BL p-Class server blade enclosures with enhanced backplane components are required to support BL30p server blades.
   Server blade enclosures with enhanced backplanes can be purchased with licenses for Rapid Deployment Pack:
   BL p-Class server blade enclosure with enhanced backplanes with 8 Rapid Deployment Pack licenses (281404-B22)
   or
   BL p-Class server blade enclosure with enhanced backplanes with Rapid Deployment Pack trial (243564-B22)

   PLUS

   Select an Interconnect Kit. Each Interconnect Kit contains a pair of interconnects. One interconnect kit is required with each server blade enclosure:
   RJ-45 Patch Panel 2 with Fibre Channel pass through. This is the required patch panel model for Fibre Channel connectivity on BL30p (306465-B21).
   or

RJ-45 Patch Panel (230766-B21)
or
BL p-Class C-GbE2 Interconnect Kit (with 12 RJ-45 10/100/1000 T/TX/T external ports) (283192-B21) with or without optional ProLiant BL p-Class GbE2 Storage Connectivity Kit (with 16 Fibre Channel connectors) (321745 -B21) (required for BL30p Fibre Channel connectivity when using the GbE2 Interconnect Switch)
or
BL p-Class F-GbE2 Interconnect (with 8 LC 1000 SX and 4 RJ-45 10/100/1000 T/TX/T external ports) (283193-B21) with or without optional ProLiant BL p-Class GbE2 Storage Connectivity Kit (with 16 Fibre Channel connectors) (321745 -B21) (required for BL30p Fibre Channel connectivity when using the GbE2 Interconnect Switch)
or
BL p-Class C-GbE Interconnect Kit (with 4 RJ-45 10/100/1000 T/TX/T and 8 RJ-45 10/100 T/TX external ports (249655-B21)
or
BL p-Class F-GbE Interconnect Kit (with 4 LC 1000 SX and 8 RJ-45 10/100 T/TX external ports) (279720-B21)

PLUS

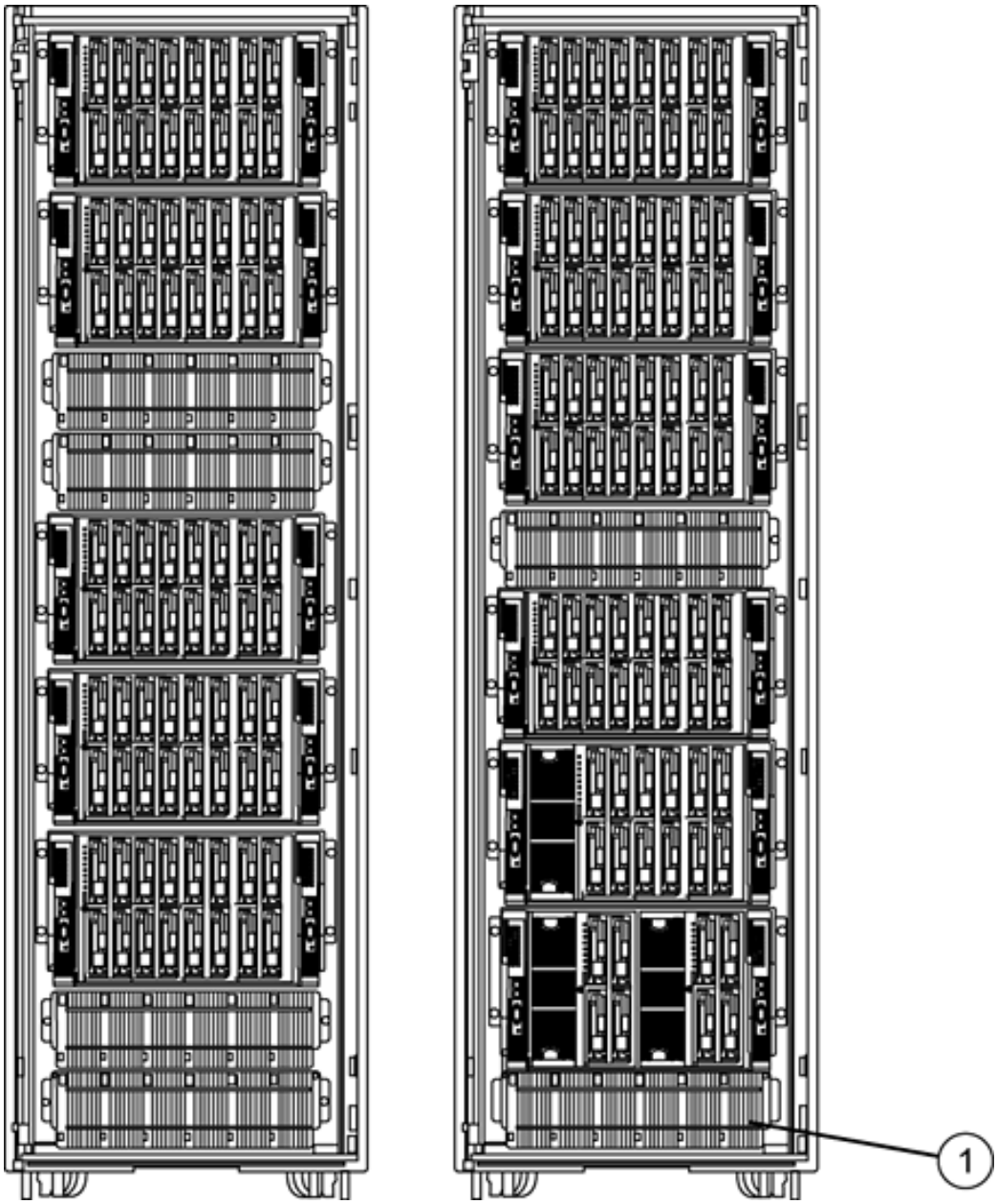
5. Select BL p-Class power enclosure(s) and power supplies based on configuration.
   NOTE: 3 phase power enclosure options are highly recommended for deployments of BL30p server blades.
   Use the ProLiant BL p-Class sizing utility to help determine power configuration:
   http://h30099.www3.hp.com/configurator/calc/Power%20Calculator%20Catalog.xls .
   NOTE: Power enclosures and supplies are not needed if using facility DC (-48V ± 10%).

   3 phase power enclosure with six power supplies (3 phase power enclosure holds six power supplies) (NA/JPN- 230769-001) (INTL - 230769-421)
   (Power enclosures and supplies can also be purchased separately see options list)

   PLUS

6. Select power distribution option:
   Mini bus bars (support up to 3 server blade enclosures) (240559-B21). Note that two mini-bar configurations can be stacked to fill a 42U rack.
   or
   Scalable bus bars (support up to 5 server blade enclosures) (240560-B21)
   or
   Power Bus Box (supports a single server blade enclosure) (240562-B21)

ProLiant BL p-Class Server Blade Enclosures with Enhanced Backplanes Installed in 42U Rack
Redundant Power Configuration (left) and Non-Redundant Power Configurations (right)



1. Power Enclosure

Standard Features (Server Blade)

Processor	Intel Xeon Processor 3.2-GHz/533-MHz with 2MB L3 cache Intel Xeon Processor 3.2-GHz/533-MHz with 1MB L3 cache Intel Xeon Processor 3.06-GHz/533-MHz with 512KB L2 cache	
Upgradeability	BL30p Server Blade is dual-processor capable	
Cache Memory *One of the following depending on Model*	2-MB Level 3 cache 1-MB Level 3 cache 512-KB Level 2 cache	
Chipset	ServerWorks GC-LE chipset **NOTE:** For more information regarding the ServerWorks chipset, see the following website: http://www.serverworks.com/products/overview.html	
Memory	Standard	1024-MB (1 x 1-GB) PC2100 DDR SDRAM running at 266MHz; non-interleaved unless a second DIMM option installed 287497-B21
	Maximum	4-GB
	Flex Memory	BL30p blade supports memory interleaving when an identical pair of DIMMs is installed
Network Adapter	Three (3) network adapters total: Two (2) NC7781 PCI-X Gigabit NICs (embedded) with WOL and PXE One 10/100T NIC (embedded) dedicated to iLO management	
Integrated Manageability	Integrated Lights-Out (iLO) Management Advanced Pack with new static IP bay configuration feature	
Internal Storage	Hard Drives	None ship standard
	Maximum Internal Storage	120-GB (2 x 60-GB small form factor ATA, 5400 RPM hard drives)

Fiber Channel on the ProLiant BL30p

The following items are needed to connect the ProLiant BL30p to a SAN via Fibre Channel:

1. ProLiant BL30p blade with Dual-Port Fibre Channel Adapter (option) installed

- The Dual-Port Fibre Channel Adapter option 354054-B21 is compatible with the ProLiant BL30p blade (not compatible with ProLiant BL20p series blades)
- Two ports on each configured blade provide redundant Fibre Channel connections
- Supports up to 2 Gb/s and backward compatible with existing 1 Gb/s Fibre Channel equipment
- Based on the QLogic ISP2312 chipset
- Kit includes two small form factor pluggable transceivers with LC connectors for installation into the interconnect option kit (see 2A and 2B below)

AND

2A. RJ-45 Patch Panel 2 (with Fibre Channel pass through) interconnect option

- Enables pass through of both Ethernet and Fibre Channel signals
- Ethernet signals exit the rear of the RJ-45 Patch Panel 2 interconnects
- Fibre Channel signals exit the front of the RJ-5 Patch Panel 2 interconnects
  - 8 Fibre Channel small form factor pluggable (SPF) transceiver cages on the front of each Patch Panel 2 interconnect (16 Fibre Channel SPF transceiver cages per server blade enclosure)
  - SPF transceivers are included with the BL30p Dual-Port Fibre Channel Adapter kit (option)

OR

2B. C-GbE2 or F-GbE2 Interconnect Kit plus the GbE2 Storage Connectivity Kit (option)

- Enables Ethernet signal consolidation and pass through of Fibre Channel signals
- Both Ethernet and Fibre Channel signals exit the rear of the GbE2 Interconnect Switch (with the GbE2 Storage Connectivity Kit option)
  - 8 Fibre Channel small form factor pluggable (SPF) transceiver slots on the back of each GbE2 Interconnect Switch (16 Fibre Channel SPF transceiver cages per server blade enclosure)
  - SPF transceivers included with the BL30p Dual-Port Fibre Channel Adapter kit (option)

AND

3. Compatible SAN

- Optimized for StorageWorks arrays:
  - Modular Smart Array 1000
  - Enterprise Virtual Array 5000 (EVA5000) V2; Enterprise Virtual Array 3000 (EVA3000)
  - XP48, 128, 512, 1024;
- Compatible with select 3rd party SANs. Refer to blade storage website for details: http://h18000.www1.hp.com/products/servers/proliant-bl/p-class/storage.html

Local I/O Cable

Connects to the front of BL30p server blade for local management and aid in first server blade configuration

Two (2) USB ports, one (1) video port, one (1) iLO port and one (1) serial port

Two (2) Local I/O cables ship with each server blade enclosure with enhanced backplane components (281404-B22 and 243564-B22)

NOTE: Tested USB devices (keyboard, mouse, floppy) are listed in options section below.

ProLiant BL p-Class Server Blade Enclosure and Interconnects

ProLiant BL p-Class Server Blade Enclosure

6U (10.5-inch), 19-inch wide

Holds up to:

- Eight (8) ProLiant BL20p series server blades
- Sixteen (16) ProLiant BL30p series server blades (BL30p blade sleeves required)
- Two (2) ProLiant BL40p series server blades
- A combination of the above

NOTE: ProLiant BL p-Class server blade enclosures with enhanced backplane components are required to support BL30p server blades.
NOTE: Server Blade Enclosure Upgrade Kit (354100-B21) contains enhanced backplane components and enables a field upgrade of a blade enclosure to support BL30p series blades and provide a single, physical iLO port for the enclosure.

Two (2) outside bays for interconnects (Patch Panel, Patch Panel 2, GbE Interconnect Switch, or GbE2 Interconnect Switch)

Server blade management module on the rear of the server blade enclosure is hot-plug, has a centralized 10/100T iLO port for all installed blades, reports events of all installed blades and provides asset and inventory information via SNMP.

ProLiant BL p-Class Power Requirements

Redundant 208V 30amp 3-phase 4 wire, NA
Redundant 380 - 415V 20A 3-phase 5 wire, Intl
NOTE: 3 phase power highly recommended for BL30p deployments.
Redundant 200V - 240V AC, 30 amp single-phase for NA and International
Redundant -48VDC ± 10%

Standard Features (Server Blade Enclosure and Interconnects)

ProLiant BL p-Class Interconnect Switch Option

(A pair of switches per kit)

(Each server blade enclosure requires a pair of interconnects - patch panels or interconnect switches)

Interconnect Switch interconnects consolidate the Ethernet signals from the server blades to a smaller set of external copper-based or fiber-based uplink ports for connection to the network infrastructure. Like the Patch Panel interconnects, an option is also available to pass through individual BL20p G2 and BL30p Fibre Channel signals.

The interconnect switches provide up to a 32-to-1 server network cable reduction per server enclosure depending on the mix of BL20p series, BL30p series, and BL40p series blades. Each interconnect switch pair reduces up to sixteen internal server network (NIC) ports to one to six external ports (four on a modular rear mounting interconnect and two on the switch front panel). This provides a total of twelve external ports per server blade enclosure.

The GbE2 Interconnect Kits (C-GbE2 and F-GbE2) provide NIC consolidation to 1000 Mbps (Gigabit Ethernet), advanced network feature support including layer 3-7 switching, Fibre Channel pass-through (for BL20p series and BL30p series blades), and 10 Gigabit Ethernet bandwidth connectivity to the network. Expandability of both layer 3-7 switching and 10 Gigabit Ethernet is planned with future GbE2 Interconnect Switch upgrade options available through Nortel Networks.

- The ProLiant BL p-Class F-GbE2 Interconnect Kit includes two GbE2 Interconnect Switches and two QuadSX Interconnect Modules that provide eight (8) LC 1000 SX and four (4) RJ-45 10/100/1000 T/TX/T external ports per server blade enclosure.
- The ProLiant BL p-Class C-GbE2 Interconnect Kit includes two GbE2 Interconnect Switches and two QuadT2 Interconnect Modules that provide twelve (12) RJ-45 10/100/1000 T/TX/T external ports per server blade enclosure.
- The optional ProLiant BL p-Class GbE2 Storage Connectivity Kit (321745 -B21) is required for Fibre Channel pass-through when using either the C-GbE2 or F-GbE2 Interconnect Kit.

The GbE Interconnect Kits (C-GbE and F-GbE) provide NIC consolidation to 100 Mbps (Fast Ethernet).

- The ProLiant BL p-Class F-GbE Interconnect Kit includes two GbE Interconnect Switches and two DualTSX Interconnect Modules that provide four (4) LC 1000 SX and eight (8) RJ-45 10/100 T/TX external ports per server blade enclosure.
- The ProLiant BL p-Class C-GbE Interconnect Kit includes two GbE Interconnect Switches and two QuadT Interconnect Modules that provide four (4) RJ-45 10/100/1000 T/TX/T and eight (8) RJ-45 10/100 T/TX external ports per server blade enclosure.

Also included (per Interconnect Switch):

- One (1) RS-232 DB-9 front panel out-of-band management port
- Redundant crosslink ports connecting the two interconnect switches
- Redundant power inputs and on-board redundant fans
- Hot-plug and hot- remove with configuration retention and no need to cable/re-cable
- Power ON, management, and per port status and speed LED indicators
- Reset/power momentary push-button switch
- HP ProLiant BL Interconnect Switch Management Utilities and User Documentation CD
- Fully pre-configured for rapid deployment and immediate operation

The GbE Interconnect Kits (C-GbE and F-GbE) are for applications that require network adapter consolidation to 100 Mbps (Fast Ethernet).

- The ProLiant BL p-Class F-GbE Interconnect Kit includes two GbE Interconnect Switches and two DualTSX Interconnect Modules that provide four (4) LC 1000 SX and eight (8) RJ-45 10/100 T/TX external ports per server blade enclosure.
- The ProLiant BL p-Class C-GbE Interconnect Kit includes two GbE Interconnect Switches and two QuadT Interconnect Modules that provide four (4) RJ-45 10/100/1000 T/TX/T and eight (8) RJ-45 10/100 T/TX external ports per server blade enclosure.

ProLiant BL Interconnect Switch Management System and Utilities:

Full featured web-based and scriptable command line (CLI) interfaces, password protected multi-level user accounts, Telnet, SNMP, BootP client, port mirroring, port-based VLANs and VLAN tagging, EtherChannel compatible multi-port trunking, network time protocol, spanning tree protocol, broadcast/multicast storm control, flow control, human readable/writeable configuration file, TFTP client, IP address security restrictions, auto-MDI/MDIX, auto-negotiation and auto-sensing of speed and duplex mode, and more.

Standard Features (Server Blade Enclosure and Interconnects)

ProLiant BL p-Class GbE2 Storage Connectivity Kit Option (supports a pair of GbE2 switches)	The GbE2 Storage Connectivity Kit (option) is required for Fibre Channel signal pass-through when using a GbE2 Interconnect Switch Kit. Both Ethernet cable consolidation and Fibre Channel connectivity is possible using a single interconnect option. Order one GbE2 Storage Connectivity Kit per server blade enclosure for Fibre Channel pass through of BL20p and BL30p series blades. The GbE2 Storage Connectivity Kit includes two OctalFC Interconnect Modules that provide sixteen open transceiver cages for the pluggable small form factor transceivers that come with each BL30p Dual-Port Fibre Channel Adapter (option) and each BL20p Dual Port Fibre Channel Adapter. The GbE2 Storage Connectivity Kit supports up to eight BL20p series, up to sixteen BL30p series blades or combinations thereof.
ProLiant BL p-Class RJ-45 Patch Panel (A pair of patch panels provided per kit) (Each server blade enclosure requires a pair of interconnects - patch panels or interconnect switches)	6U (10.5-inch), plugs into BL p-Class 6U server blade enclosures. Passes through Ethernet NIC signals, from all installed server blades, individually out as RJ-45 connections. Supports Gigabit Ethernet network adapters. 16 RJ-45 connectors on the back of each RJ-45 Patch Panel (32 RJ-45 connections per server blade enclosure). The benefits to the RJ-45 Patch Panel are that it: - Allows the customer to connect signals to their own LAN infrastructure components. - Provides very economical option enabling the lowest cost blade solution. - Is completely passive and requires no software or management.
ProLiant BL p-Class RJ-45 Patch Panel 2 (with Fibre Channel pass through) (A pair of patch panels provided per kit) (Each server blade enclosure requires a pair of interconnects - patch panels or interconnect switches) **NOTE:** Either Patch Panel 2 or a GbE2 Interconnect Kit is required for SAN connectivity with BL20p series and BL30p series blades.	6U (10.5-inch), plugs into BL p-Class 6U server blade enclosures. Passes through Ethernet NIC signals, from all installed server blades, individually out as RJ-45 connections. Supports Gigabit Ethernet network adapters. 16 RJ-45 connectors on the back of each RJ-45 Patch Panel 2 (32 RJ-45 connections per server blade enclosure). Passes through Fibre Channel signals, from all installed BL20p and BL30p series server blades, individually out through small form factor pluggable (SPF) transceiver cages. Supports 2 Gb/s Fibre Channel signals and backward compatible with existing 1 Gb/s Fibre Channel equipment. 8 Fibre Channel small form factor pluggable (SPF) transceiver cages on the front of each Patch Panel 2 (16 Fibre Channel SPF transceiver cages per server blade enclosure). The benefits to the RJ-45 Patch Panel 2 are that it: - Allows the customer to connect signals to their own LAN and SAN infrastructure components. - Provides a very economical option enabling the lowest cost blade solution. - Is completely passive and requires no software or management. - Electrically isolates the Ethernet and Fibre Channel signals from each other.
ProLiant BL p-Class Fibre Channel pass through	Fibre Channel signals travel from a ProLiant BL20p series and/or BL30p series blades through the server blade enclosure backplane. Fibre Channel signals are terminated through the RJ-45 Patch Panel 2 or GbE2 Interconnect Switch (with GbE2 Storage Connectivity Kit) in the interconnect bays. To provide redundancy each server blade has two Fibre Channel signals; one Fibre Channel signal terminates through the right interconnect, the other Fibre Channel signal terminates through the left interconnect. Eight Fibre Channel small form factor pluggable (SPF) transceiver cages exist on the front of each RJ-45 Patch Panel 2 and rear of each GbE2 Interconnect Switch (16 Fibre Channel connections per server blade enclosure). The SPF cages are used for insertion of SPF transceivers included with the BL20p G2 Dual-port Fibre Channel Mezzanine Card and the BL30p Dual-Port Fibre Channel Adapter.

Standard Features (Server Blade Enclosure and Interconnects)

Required Network Cabling	10Base-T	Categories 3, 4 or 5 UTP (100 meters) EIA/TIA-568 100-ohm STP (100 meters)
	100Base-TX	Category 5 UTP (100 meters) EIA/TIA-568 100-ohm STP (100 meters)
	1000Base-T	Category 5 UTP (100 meters) EIA/TIA-568 100-ohm STP (100 meters)
	1000Base-SX	50/125 µm Multimode Fiber, 400 MHz/Km (500 meters) 50/125 µm Multimode Fiber, 500 MHz/Km (550 meters) 62.5/125 µm Multimode Fiber, 160 MHz/Km (220 meters) 62.5/125 µm Multimode Fiber, 200 MHz/Km (275 meters)

NOTE: For cabling information, refer to the website at: http://www.hp.com/go/servers/.

Standard Features (Power System and Rack Information)

ProLiant BL p-Class Power System and Rack Information

NOTE: To determine power configuration, please refer to the ProLiant BL p-Class Overview and Planning Whitepaper and sizing utility at http://www.hp.com/products/servers/proliant-bl/p-class/info/.

ProLiant BL p-Class Power Enclosure

3U (5.25-inch), 19-inch wide, 29-inch deep (0.48-meter wide, 0.74-meter deep), dual input single phase and three phase models available.

BL p-Class power enclosure provides scalable rack-centralized, hot-plug power without the need for PDUs.
Each 3 phase power enclosure houses six hot-plug power supplies
Each single-phase power enclosure holds four hot-plug power supplies
Please use the sizing utility to determine the power needed for each configuration
http://h30099.www3.hp.com/configurator/powercalcs.asp
NOTE: 3 phase power enclosure options highly recommended for BL30p deployments.

Power enclosures and power supplies are not needed if using facility DC (-48V DC ± 10%). If using facility DC, Facility DC Power Connection kit (240563-B21) is needed.

BL p-Class Power Distribution

-48 VDC power (from the power enclosures or facility DC power) is carried from the power enclosures to the server blade enclosures through bus bars (for multiple enclosures) or power bus boxes (for a single enclosure). Hinges attach the bus bars to the rack rails and provide easy rear access to the blade enclosures and interconnects. Power is distributed through independent A- and B-sided bus bars.

Three power distribution solutions are available depending on the size of the intended deployment (see table).

	Power Enclosures Supported	Server Blade Enclosures Supported	Max. Rack Space Occupied
Scalable Bus Bar	1 or 2	up to 5	36U
Mini Bus Bar	1 or 2*	up to 3	24U
Power Bus Box	1	1	9U
	NOTE*: Dual power input kit for mini bus bar option (364565-B21) required to support two power enclosures. **NOTE:** To support a full 42U rack of BL p-Class server blades, use two stacked pairs of mini bus bars.		

Required Power Source

Two 30-Amp redundant power feeds per power enclosure
Connectors:

1. NEMA receptacles
   - NA 1-phase L6-30, 250v, 30A 3-wire
   - NA 3-phase L15-30, 250V, 30A, 4-wire

For cabling information, refer to the website at: http://www.hp.com/go/servers/

Standard Features (Manageability)

ProLiant Essentials Foundation Pack Software for the ProLiant BL Server	ProLiant Essentials Rapid Deployment Pack	Rapid Deployment Pack (RDP) is an automated deployment and provisioning solution for all ProLiant servers. RDP includes the Altiris Deployment Solution and ProLiant Integration Module featuring ProLiant server pre-configured events for OS installation, and optimized software drivers, firmware and management agents. Every RDP CD includes 10-node trial licenses for evaluation purposes. RDP requires a license for each server deployed and are available for purchase with blade servers. For more information, visit http://www.hp.com/servers/rdp.
	HP Systems Insight Manger	HP Systems Insight Manager (HP SIM) help maximize system uptime and performance and reduce system maintenance costs by providing proactive notification of problems before those problems result in unplanned downtime or reduced productivity. HP SIM is easy to set up to work with the Insight Management Agents, integrated Light-Out and Remote Insight Light-Out Edition, and Version Control Agents to deliver robust fault, configuration, and asset management as well as remote administration. With HP Systems Insight Manager customers will also be able to take advantage of role-based security; the ability to manage ProLiant, Integrity, and HP9000 systems; and plug-ins for storage, client, printer, and power management as well as server rapid deployment, performance management, and workload management. For more details on HP Systems Insight Manager visit http://www.hp.com/go/hpsim.
	Management Agents	The Management Agents form the foundation for HP's Intelligent Manageability strategy. They provide direct, browser-based access to in-depth instrumentation built into HP servers, workstations, desktops, and portables, and send alerts to HP Systems Insight Manager and other enterprise management applications in case of subsystem or environmental failures. For additional information about the Management Agents and other management products from HP, please visit the management Web site at http://www.hp.com/servers/manage.
	Subscriber's Choice	Subscriber's Choice Driver and Support Alerts/Notifications is a web-based email subscription service that provides software and driver change notifications for ProLiant products. Sign up at http://www.hp.com/go/subscriberschoice and customize your profile to receive various new alerts as they become available, on a weekly or monthly basis.
	ROMPaq, support software, and configuration utilities	The latest software, drivers, and firmware fully optimized and tested for your ProLiant server and options, available in the RDP CD, SmartStart or downloadable from Software and Drivers download pages, linked from the SmartStart website at http://www.hp.com/servers/smartstart.
	Survey Utility and diagnostics utilities	The most advanced configuration analysis, reporting and troubleshooting utilities used by HP and at your fingertips, available in SmartStart.

NOTE: For more information regarding ProLiant Essentials Software, please see the following URL: http://www.hp.com/servers/proliantessentials

Optional ProLiant Essentials Value Packs

Optional software offerings that selectively extend the functionality of an Adaptive Infrastructure to address specific business problems and needs:

- Workload Management Pack - provides easier management of complex environments, improving overall server utilization and enabling customers for the first time to confidently deploy multiple applications on a single multiprocessor ProLiant Server.
- Performance Management Pack - identifies and explains hardware performance bottlenecks on ProLiant servers and attached options enabling users to better utilize their valuable resources.

NOTE: Flexible and volume quantity license kits are available for ProLiant Essentials Value Packs. Refer to http://www.hp.com/servers/proliantessentials or the various ProLiant Essentials Value Pack product QuickSpecs for more information.

Standard Features (Manageability)

SmartStart

SmartStart is a tool that simplifies single server setup, providing a rapid way to deploy reliable and consistent server configurations. SmartStart 7.00 and later can now deploy the ProLiant BL20P G3 and ProLiant BL40P servers, using the I/O port with an attached USB CD-ROM device. To obtain a copy of SmartStart for your blade server, redeem the coupon that is included with your Blade server or order your copy from the SmartStart web site. For more information, please visit the SmartStart Web site at http://www.hp.com/servers/smartstart.
SmartStart version supported (minimum): SmartStart 6.20

OS Support

Microsoft® Windows®
LINUX

NOTE: For a more complete and up-to-date listing of supported operating systems and versions, please visit our OS Support Matrices website: http://www.hp.com/go/ossupport
NOTE: For an up-to-date listing of the latest drivers available for the ProLiant BL p-Class, please visit the support website: http://www.hp.com/products/servers/proliant-bl/p-class/info/

Intelligent Manageability

Integrated Lights-Out (iLO) Advanced Pack

- Static IP bay configuration -- new feature for ProLiant BL p-Class blades
- Virtual Text and Graphical Remote Console
- Virtual CD-ROM and Virtual Floppy
- Virtual Power Button Control
- Dedicated LAN Connectivity
- Automatic IP Configuration via DHCP/DNS/WINS
- Industry Standard 128-bit Secure Sockets Layer (SSL) Security
- IML and iLO Event Logging
- Support for 12 user accounts with customizable access privileges

NOTE: For more information on iLO Advanced visit the website: http://www.hp.com/servers/ilo/

Automatic Server Recovery-2 (ASR-2)
Redundant ROM
Remote Flash ROM
ROM Based Setup Utility (RBSU)
Advanced Configuration and Power Interface Specification Ready (ACPI)
Server and Interconnect Switch Health Logs
Redundant Power Supply Utility
Pre-Failure Warranty (covers processors, as well as hard drives and memory)
Interconnect Switch Management System and Utilities (Interconnect Switch option)
Integrated Management Log (IML)
Off-Line Backup Processor capability
Dynamic sector repairing and drive parameter tracking (with Smart Array controllers)
Network adapter teaming set-up utility

Standard Features (Manageability)

ProLiant BL p-Class Availability Features

- Power redundancy:
  - hot-plug power supplies
  - redundant AC feeds (requires two power enclosures when using blade enclosures with enhanced backplane components)
  - interconnects options and server blade management module share power from both A- and B- side power buses
- Dual-Port Fibre Channel Mezzanine Card for redundant SAN connections
- Redundant ROM on each server blade
- ECC Memory
- Network adapter teaming (network fault tolerance, transmit load balancing, switch-assisted load balancing)

Interconnect Switch availability features:

- Hot-plug and hot- remove with configuration retention and no need to cable/re-cable
- Two network connections per BL30p server blade routed to independent interconnect switches
- Redundant Ethernet inter-switch communication with two sets of redundant Ethernet uplink ports per each interconnect switch
- Redundant front panel ports per each interconnect switch for diagnostics, management, and additional uplinks
- Redundant serial ports
- Compatibility with PVST+ (GbE2 switch) and 802.1D Spanning tree protocol support for loop-free path redundancy
- Static IEEE 802.3ad (EtherChannel compatible) trunking with automatic port load balancing and failover
- Redundant configuration files and operating system firmware images in memory (GbE2 switch)
- Redundant fans per each interconnect switch
- Redundant power to each interconnect switch
- Support for ProLiant network adapter teaming
- Redundant configurable community strings and SNMP trap manager hosts
- Redundant configurable syslog server, DNS server, and default gateways (GbE2 switch)

Security

Power-on password
Administrator's password
Integrated Lights-Out has 12 customizable user accounts and SSL encryption
Integrated Lights-Out can be disabled via a Global Setting
Interconnect switch multilevel user names and passwords, management interface time out period setting, SSH*, SCP secure copy protocol*, port-based IEEE 802.1Q tagged VLANs, RADIUS user authentication and authorization*, and IP address restriction
NOTE*: GbE2 Interconnect Switch only

Minimum Rack Requirements

Mounts in ProLiant, and Telco racks and Third Party racks that meet the following criteria:

- Compatible with 19-inch Standard EIA rail sets
- EIA rail-to-rail depth is 29 - 30"
- Cabinet depth must be at least 36-inch deep overall (Additional min. 3.5-inch clearance from rear RETMA rail to rear door, inclusive in the 36-inch overall depth)
- Ample room for top and bottom cable egress (approximately 8 square inches for full rack configuration with patch panel)
- Must be capable of supporting 1600 lb (for full rack configuration)
- Perforated front and rear doors to accommodate front-to-back cooling
- Must have 65% open perforation on server blade enclosure doors to support airflow requirements
- Optimized for use with the HP 10000 Series racks

NOTE: If using Compaq 7000 Series rack, Rack Extension Kit and High Air Flow Rack Door options are required.

Standard Features (Manageability)

Rack Airflow Requirements

- HP 10000 series racks provide enhanced airflow for maximum cooling, allowing racks to be fully loaded with servers and server blades using the latest server technologies.

CAUTION: If a third-party rack is used, observe the following additional requirements to ensure adequate airflow and to prevent damage to the equipment:

- Front and rear doors: If your 42U server rack includes closing front and rear doors, you must allow 830 square inches (5,350 sq cm) of hole evenly distributed from top to bottom to permit adequate airflow (equivalent to the required 64 percent open area for ventilation).
- Side: The clearance between the installed rack component and the side panels of the rack must be a minimum of 2.75 inches (7 cm).

CAUTION: Always use blanking panels to fill all remaining empty front panel U-spaces in the rack. This arrangement ensures proper airflow. Using a rack without blanking panels results in improper cooling that can lead to thermal damage.

NOTE: For additional information, refer to the Setup and Installation Guide or the Documentation CD provided with the server, or to the server documentation located in the Support section on the ProLiant BL30p website:http://www.hp.com/servers/bl30p.

Service and Support

Three-year limited warranty, including hardware diagnostic support, pre-failure warranty (coverage of hard drives, memory and processors). The warranty is fully supported by HP Services and a worldwide network of resellers and service providers. In addition 90-day's getting started software telephone support may be covered under the warranty or available for an additional fee. Enhancements to warranty services are available through HP Care Pack services.

NOTE: Sever Blade Limited Warranty includes 3 year Parts, 1 year Labor, 1-year on-site support.
NOTE: Server Blade Enclosure and Interconnects Limited Warranty includes 3 year Parts, 3 year Labor, 3-year on-site support.

Care Pack services provide a range of life cycle support options that let you choose the service levels that meet your business requirements, from basic to mission-critical.

A full range of HP Care Pack hardware and software services are available including:

- Installation and start up
- Education courses
- Extended onsite hardware coverage hours from same business day 13 hours, 5 day to 24 hours, 7 days call window with options including 4-hour response or 6-hour Call To Repair
- Comprehensive range of software technical support for Microsoft, Linux, ProLiant Essentials and VMWare-based IT solutions helping to deliver high level of application availability. Response times range from 30 mins for critical problems to 2 hours.
- System Management, Performance Services and Mission Critical Support Solution

HP Care Pack services for ProLiant BL p-Class server blades, cover the server blade and the p-Class blade enclosure that the server blade is installed in as well as interconnects, power enclosure with power supplies and power distribution.

NOTE: For more information on HP Care Pack services, contact any of our worldwide sales offices or resellers or visit our worldwide Web site on the internet at: http://www.hp.com/hps/carepack
NOTE: For more complete information on HP Services offerings, customers and resellers, please visit us at: http://www.hp.com/hps
NOTE: Additional information regarding worldwide limited warranty and technical support is available at: http://h18004.www1.hp.com/products/servers/platforms/warranty/index.html

Models

ProLiant BL30p X3.2-2MB, 1GB (2P) 360329-B21	**Processor(s)**	Two (2) Intel Xeon 3.2-GHz standard (up to 2 supported)
	Cache Memory	2-MB Level 3 writeback per processor
	Memory	1024-MB (standard) to 4-GB (maximum) of PC2100 DDR SDRAM running at 266-MHz (1 x 1-GB); 2-way interleaved when an identical pair installed
	Network Adapter	Two (2) NC7781 PCI-X Gigabit NICs (embedded) with WOL and PXE One (1) 10/100T NIC (embedded) dedicated to iLO management
	Hard Drives	None ship standard
	Internal Storage	Up to 120-GB maximum (with optional hard drives)
	Optical Drive	None
	I/O cable	Included
	Form Factor	Plugs vertically into BL30p blade sleeve. Blade sleeve supports 1 or 2 BL30p blades. Blade sleeve plugs vertically into ProLiant BL p-Class Server Blade Enclosure with enhanced backplane components.
ProLiant BL30p X3.2-1MB, 1GB (2P) 368271-B21	**Processor(s)**	Two (2) Intel Xeon 3.2-GHz standard (up to 2 supported)
	Cache Memory	1-MB Level 3 writeback per processor
	Memory	1024-MB (standard) to 4-GB (maximum) of PC2100 DDR SDRAM running at 266-MHz (1 x 1-GB); 2-way interleaved when an identical pair installed
	Network Adapter	Two (2) NC7781 PCI-X Gigabit NICs (embedded) with WOL and PXE One (1) 10/100T NIC (embedded) dedicated to iLO management
	Hard Drives	None ship standard
	Internal Storage	Up to 120-GB maximum (with optional hard drives)
	Optical Drive	None
	Form Factor	Plugs vertically into BL30p blade sleeve. Blade sleeve supports 1 or 2 BL30p blades. Blade sleeve plugs vertically into ProLiant BL p-Class Server Blade Enclosure with enhanced backplane components.
ProLiant BL30p X3.06/533MHz-512KB, 1GB (2P) 354566-B21	**Processor(s)**	Two (2) Intel Xeon 3.06-GHz standard (up to 2 supported)
	Cache Memory	512-KB Level 2 writeback per processor
	Memory	1024-MB (standard) to 4-GB (maximum) of PC2100 DDR SDRAM running at 266MHz (1 x 1-GB), 2-way interleaved when an identical pair installed
	Network Adapter	Two (2) NC7781 PCI-X Gigabit NICs (embedded) with WOL and PXE One (1) 10/100T NIC (embedded) dedicated to iLO management
	Hard Drives	None ship standard
	Internal Storage	Up to 120-GB maximum (with optional hard drives) 2 x 60-GB
	Optical Drive	None
	Form Factor	Plugs vertically into BL30p blade sleeve. Blade sleeve supports 1 or 2 BL30p blades. Blade sleeve plugs vertically into ProLiant BL p-Class Server Blade Enclosure with enhanced backplane components.

Models

ProLiant BL30p X3.06/533MHz-512KB, 1GB (1P) 354050-B21	**Processor(s)**	One (1) Intel Xeon 3.06-GHz standard (up to 2 supported)
	Cache Memory	512-KB Level 2 writeback per processor
	Memory	1024-MB (standard) to 4-GB (maximum) of PC2100 DDR SDRAM running at 266-MHz (1 x 1-GB), 2-way interleaved when an identical pair installed
	Network Adapter	Two (2) NC7781 PCI-X Gigabit NICs (embedded) with WOL and PXE One (1) 10/100T NIC (embedded) dedicated to iLO management
	Hard Drives	None ship standard
	Internal Storage	Up to 120-GB maximum (with optional hard drives)
	Optical Drive	None
	Form Factor	Plugs vertically into BL30p blade sleeve. Blade sleeve supports 1 or 2 BL30p blades. Blade sleeve plugs vertically into ProLiant BL p-Class Server Blade Enclosure with enhanced backplane components.

ProLiant 3.2-GHz BL30p Server Blade Multi-Pack 368272-B21 **NOTE:** Multi-pack contains 8 BL30p server blades, 4 BL30p blade sleeves and 8 licenses for Rapid Deployment Pack.	**Processor(s)**	Each blade is configured with Two (2) Intel Xeon 3.2-GHz standard (up to 2 supported)
	Cache Memory	2-MB Level 3 writeback per processor
	Memory	1024-MB (standard) to 4-GB (maximum) of PC2100 DDR SDRAM running at 266-MHz (1 x 1-GB), 2-way interleaved when identical pair installed
	Network Adapter	Two (2) NC7781 PCI-X Gigabit NICs (embedded) with WOL and PXE One (1) 10/100T NIC (embedded) dedicated to iLO management
	Hard Drives	None ship standard
	Internal Storage	Up to 120-GB maximum (with optional hard drives) 2 x 60-GB

ProLiant 3.06-GHz BL30p Server Blade Multi-Pack 354051-B21 **NOTE:** Multi-pack contains 8 BL30p server blades, 4 BL30p blade sleeves and 8 licenses for Rapid Deployment Pack.	**Processor(s)**	Each blade is configured with Two (2) Intel Xeon 3.06-GHz standard (up to 2 supported)
	Cache Memory	512-KB Level 2 writeback per processor
	Memory	1024-MB (standard) to 4-GB (maximum) of PC2100 DDR SDRAM running at 266-MHz (1 x 1-GB), 2-way interleaved when identical pair installed
	Network Adapter	Two (2) NC7781 PCI-X Gigabit NICs (embedded) with WOL and PXE One (1) 10/100T NIC (embedded) dedicated to iLO management
	Hard Drives	None ship standard
	Internal Storage	Up to 120-GB maximum (with optional hard drives) 2 x 60-GB

NOTE: HP does not allow factory integration of options into standard models listed above.
Configure-to-order servers must start with a CTO Chassis.

Step 1: Base Server Blade Configuration

Model	HP ProLiant BL30p Configurable Model	367243-405
	Configurable Model ships with: - Two embedded NC7781 PCI-X Gigabit NICs plus one 10/100T NIC for iLO - Integrated Lights-Out (iLO) Management with Advanced Pack features	

Step 2: Choose Required Options (only one of the following from each list unless otherwise noted)

Processor	**For single processor configuration choose:**	
	Xeon 3.06GHz/533-512 FIO Base	354053-L21
	For dual-processor configurations choose two each of:	
	Xeon 3.06GHz/533-512 FIO Base	354053-L21
	Xeon 3.2GHz/533-1M FIO	368273-B21
	Xeon 3.2GHz/533-2MXeon 3.2GHz/533-2M FIO	364306-B21
	NOTE: Dual-processor configurations must have a matching pair of CPUs. Mixed clock speeds are not supported.	

Memory	**NOTE:** Two-way interleaving memory is enabled when an identical pair of DIMMs is installed.	
	For 1GB Total Memory choose A or B:	
	A) 2 x 512 MB PC2100 DDR SDRAM DIMMs	300679-B21
	B) 1 x 1GB PC2100 DDR SDRAM DIMM	287497-L21
	For 2GB Total Memory both A and B are required:	
	A) 1 x 1GB PC2100 DDR SDRAM DIMM	287497-L21
	B) 1 x 1GB PC2100 DDR SDRAM DIMM	287497-B21
	For 4GB Total Memory:	
	2 x 2048MB PC2100 DDR SDRAM DIMM 2x2048	300682-B21

Step 3: Choose Additional Options for Factory Integration

Hard Drive	60GB Small Form Factor ATA Hard Drive, 5400 rpm	354052-B21
Fibre Channel Option	BL30p Dual Port Fibre Channel Adapter	354054-B21
	NOTE: For additional options, including BL30p blade sleeve, server blade enclosure with enhanced backplanes, interconnect options and power subsystem options, please refer to the "Options" section below.	

Options

NOTE: Some options may not be factory integratable. Please contact your local sales representative for additional information.

Unique Options	ATA Hard Drive Kit for ProLiant BL30p, 2.5" parallel ATA drive, 60GB, 5400 rpm (option)	354052-B21
	ProLiant BL30p Blade Sleeve Kit (option)	354101-B21
	NOTE: Each blade sleeve supports one or two BL30p server blades.	
ProLiant BL30p Dual-Port Fibre Channel Adapter	Dual-Port Fibre Channel Adapter (2-Gb) Kit (option) for ProLiant BL30p **NOTE:** When using this card, Patch Panel 2 or a GbE2 Interconnect Switch Kit (with GbE2 Storage Connectivity Kit) must be used to provide pass through of the Fibre Channel signals.	354054-B21
ProLiant Essentials Value Pack Software	Rapid Deployment Pack, 10 User, V1.x **NOTE:** The above licenses allow 10 servers to be managed and deployed via the Deployment Server. **NOTE:** Not necessary if you purchase the BL30p Multi-Pack (354051-B21) or server blade enclosure with 8 Rapid Deployment Pack licenses 281404-B22. **NOTE:** Rapid Deployment pack is now available in a Linux Edition for Linux-only environments.	269817-B21
	Rapid Deployment Pack, 1 User, V1.x **NOTE:** The above licenses allow 1 server to be managed and deployed via the Deployment Server. **NOTE:** Not necessary if you purchase the BL30p Multi-Pack (354051-B21) or server blade enclosure with 8 Rapid Deployment Pack licenses 281404-B22. **NOTE:** Rapid Deployment pack is now available in a Linux Edition for Linux-only environments.	267196-B21
	Flexible Quantity License Kit	302127-B21
	License-Only - for use with a Master License Agreement	302128-B21
	ProLiant Essentials Intelligent Networking Pack, Single Server License **NOTE:** For use with a single server. Contains one license with a unique license activation key and documentation.	372906-B21
	ProLiant Essentials Intelligent Networking Pack, Flexible License **NOTE:** For use with multiple servers. This part number can be used to purchase multiple licenses with a single activation key. The quantity ordered for this part number will be the quantity of licenses included in the kit in the form of a corresponding activation key. Use the same key to activate all licenses in the actual quantity ordered. For a given order, one kit will be delivered with the activation key, and documentation.	372950-B21
	ProLiant Essentials Intelligent Networking Pack, Tracking License **NOTE:** For use with signed and implemented Activation Key Agreements only. Purchase of this part number entitles the customer to deploy additional licenses of the product under the terms of the existing Activation Key Agreement. **NOTE:** Nothing is delivered in conjunction with the purchase of this part number. Visit http://h18004.www1.hp.com/products/servers/proliantessentials/license/akalic.html for more information on Activation Key Agreements.	372951-B21
	ProLiant Essentials Workload Management Pack (Featuring Resource Partitioning Manager version 2.0) **NOTE:** For more information regarding ProLiant Essentials Software, please see the following URL: http://hp.com/servers/proliantessentials. **NOTE:** Flexible and volume quantity license kits are available for ProLiant Essentials Value Packs. Refer to URL http://hp.com/servers/proliantessentials or the various ProLiant Essentials Value Pack product QuickSpecs for more information.	303284-B21

Options

Processor	Intel Xeon 3.06-GHz / 512-KB cache Processor Kit (option) **NOTE:** There is no option kit offered for the ProLiant BL30p with Intel Xeon 3.2GHz processor because all models ship with two processors installed.	354053-B21
Memory (SDRAM DIMMs)	4096-MB of Advanced ECC PC2100 DDR SDRAM DIMM Memory Kit (2 x 2-GB)	300682-B21
	1024-MB of Advanced ECC PC2100 DDR SDRAM DIMM Memory Kit (1 x 1-GB) **NOTE:** This DIMM option is an identical match to the DIMM installed on the BL30p base model and therefore provides 2-way interleaving when installed on a base model BL30p blade.	287497-B21
	1024-MB of Advanced ECC PC2100 DDR SDRAM DIMM Memory Kit (2 x 512-MB)	300679-B21
BL p-Class Server Blade Enclosures with enhanced backplane components	ProLiant BL p-Class Server Blade Enclosure (includes enhanced backplane components)	243564-B22
	ProLiant BL p-Class Server Blade Enclosure with eight (8) ProLiant Essentials Rapid Deployment Pack Licenses (includes enhanced backplane components) **NOTE:** ProLiant BL p-Class server blade enclosures with enhanced backplane components are required to support BL30p server blades.	281404-B22
	ProLiant BL p-Class Server Blade Enclosure Upgrade Kit (option) **NOTE:** Server Blade Enclosure Upgrade Kit (354100-B21) contains enhanced backplane components and enables a field upgrade of a blade enclosure to support BL30p series blades and provide a single, physical iLO port for the enclosure.	354100-B21

Options

BL p-Class Interconnects	ProLiant BL p-Class Patch Panel 2 Kit with Fibre Channel pass-through (pair) **NOTE:** Only one interconnect kit required per server blade enclosure.	306465-B21
	ProLiant BL p-Class Patch Panel (pair) **NOTE:** Only one interconnect kit required per server blade enclosure.	230766-B21
	ProLiant BL p-Class C-GbE2 Interconnect Kit (with pair of GbE2 Interconnect Switches and two QuadT2 Interconnect Modules) **NOTE:** Only one interconnect kit required per server blade enclosure.	283192-B21
	ProLiant BL p-Class F-GbE2 Interconnect Kit (with pair of GbE2 Interconnect Switches and two QuadSX Interconnect Modules) **NOTE:** Only one interconnect kit required per server blade enclosure.	283193-B21
	ProLiant BL p-Class GbE2 Storage Connectivity Kit (with pair of OctalFC Interconnect Modules and two Fibre Channel signal conditioning cards) **NOTE:** Required for BL30p Fibre Channel signal pass through when using the GbE2 Interconnect Switch. **NOTE:** Only one Storage Connectivity Kit required per each GbE2 Interconnect Kit.	321745 -B21
	ProLiant BL p-Class C-GbE Interconnect Kit (with pair of GbE Interconnect Switches and two QuadT Interconnect Modules) **NOTE:** Only one interconnect kit required per server blade enclosure. **NOTE:** The GbE Interconnect Switch supports server NIC speeds to 100 Mbps. It is recommended that a Patch Panel Kit or GbE2 Interconnect Switch Kit option be used if server NIC speeds to 1000 Mbps are required. **NOTE:** To meet applicable radio frequency (RF) emission limits, the sidewall panels on the ends of any individual rack or a series of coupled racks and the front and rear doors must be installed in any racks containing more than one ProLiant BL p-Class GbE Interconnect Kit.	249655-B21
	ProLiant BL p-Class F-GbE Interconnect Kit (with pair of GbE Interconnect Switches and two DualTSX Interconnect Modules) **NOTE:** Only one interconnect kit required per server blade enclosure. **NOTE:** The GbE Interconnect Switch supports server NIC speeds to 100 Mbps. It is recommended that a Patch Panel Kit option be used if server NIC speeds to 1000 Mbps are required. **NOTE:** To meet applicable radio frequency (RF) emission limits, the sidewall panels on the ends of any individual rack or a series of coupled racks and the front and rear doors must be installed in any racks containing more than one ProLiant BL p-Class GbE Interconnect Kit.	279720-B21

BL p-Class Power Options	**NOTE:** Use p-Class sizing tool to help determine power configuration: http://h30099.www3.hp.com/configurator/powercalcs.asp	
	Single Phase Redundant Power Enclosure with 4 power supplies (Single Phase Power Enclosure holds a maximum of 4 power supplies; no need to order additional power supplies with this option kit)	239162-001
	3 Phase Redundant Power Enclosure with 6 power supplies (3 Phase Power Enclosure holds a maximum of 6 power supplies; no need to order additional power supplies with this option kit)	230769-001
	Single Phase Power Enclosure (empty) (Holds up to 4 power supplies; power supplies are not included in this kit)	231710-001
	3 Phase Power Enclosure (empty) (Holds up to 6 power supplies; power supplies are not included in this kit)	231709-001
	Single Power Supply	239161-B21
	Facility DC Power Connection	240563-B21

Options

ProLiant BL p-Class Power Distribution	Scalable Bus Bar	240560-B21
	Mini Bus Bar	240559-B21
	Dual Power Input Kit for Mini Bus Bar	364565-B21
	Power Bus Box	240562-B21
ProLiant BL p-Class Other Options	Diagnostic Station	230743-B21
	ProLiant BL p-Class Server Enclosure Shipping Bracket Option Kit **NOTE:** Used to secure one server blade enclosure in a rack when moving.	293121-B21
	ProLiant BL p-Class Power Enclosure Shipping Bracket Option Kit **NOTE:** Used to secure one power enclosure in a rack when moving.	365044-B21
	Bus Bar Telco Rack Kit	245249-B21
	Enclosure Telco Rack Kit	266076-B21
Tape Libraries	**HP StorageWorks MSL6000 Tape Library**	
	MSL6030, 1 drive, 30 slots, Ultrium 460, RM	330731-B22
	MSL6030, 2 drive, 30 slots, Ultrium 460, RM	330731-B23
	MSL6030, 1 drive, 30 slots, Ultrium 460, RM with embedded FC router	330731-B24
	MSL6030, 2 drive, 30 slots, Ultrium 460, RM with embedded FC router	330731-B25
	MSL6030, 1 drive, 30 slots, Ultrium 460, TT	330788-B21
	MSL6030, 2 drive, 30 slots, Ultrium 460, TT	330788-B22
	MSL6060, 2 drive, 60 slot, Ultrium 460, RM	331196-B21
	MSL6060, 2 drive, 60 slot, Ultrium 460, RM with embedded FC router	331196-B22
	MSL6060, 2 drive, 60 slot, Ultrium 460, TT	331195-B21
	NOTE: Please reference the MSL6000 Tape Library QuickSpecs at http://www.hp.com/go/automation for additional information needed to create a complete solution; reference current compatibility information at http://www.hp.com/go/ebs	
	HP StorageWorks MSL5026S2 Tape Library	
	MSL5026S2, 1 drive, 26 slots, SDLT 320, RM	293472-B22
	MSL5026S2, 2 drive, 26 slots, SDLT 320, RM	293472-B23
	MSL5026S2, 1 drive, 26 slots, SDLT 320, RM with embedded FC router	293472-B24
	MSL5026S2, 2 drive, 26 slots, SDLT 320, RM with embedded FC router	293472-B25
	MSL5026S2, 1 drive, 26 slots, SDLT 320, TT	293473-B21
	MSL5026S2, 2 drive, 26 slots, SDLT 320, TT	293473-B22
	NOTE: Please reference the MSL5026S2 Tape Library QuickSpecs at http://www.hp.com/go/automation for additional information needed to create a complete solution; reference current compatibility information at http://www.hp.com/go/ebs	
	HP StorageWorks MSL5052S2 Tape Library	
	MSL5052S2, 2 drive, 52 slots, SDLT 320, RM	293474-B21
	MSL5052S2, 2 drive, 52 slots, SDLT 320, RM with embedded FC router	293474-B24
	MSL5052S2, 2 drive, 52 slots, SDLT 320, TT	293476-B21
	NOTE: Please reference the MSL5052S2 Tape Library QuickSpecs at http://www.hp.com/go/automation for additional information needed to create a complete	

solution; reference current compatibility information at http:/www.hp.com/go/ebs

HP StorageWorks MSL5030 Tape Library

MSL5030, 1 drive, 30 slots, Ultrium 230, RM	301897-B22
MSL5030, 2 drive, 30 slots, Ultrium 230, RM	301897-B23
MSL5030, 1 drive, 30 slots, Ultrium 230, RM with embedded FC router	301897-B24
MSL5030, 2 drive, 30 slots, Ultrium 230, RM with embedded FC router	301897-B25
MSL5030, 1 drive, 30 slots, Ultrium 230, TT	301898-B21
MSL5030, 2 drive, 30 slots, Ultrium 230, TT	301898-B22

NOTE: Please reference the MSL5030 Tape Library QuickSpecs at http://www.hp.com/go/automation for additional information needed to create a complete solution; reference current compatibility information at http://www.hp.com/go/ebs

HP StorageWorks MSL5060 Tape Library	301899-B22
MSL5060, 2 drive, 60 slots, Ultrium 230, RM	301899-B23
MSL5060, 2 drive, 60 slots, Ultrium 230, RM with embedded FC router	301900-B21
MSL5060, 2 drive, 60 slots, Ultrium 230, TT	

NOTE: Please reference the MSL5060 Tape Library QuickSpecs at http://www.hp.com/go/automation for additional information needed to create a complete solution; reference current compatibility information at http://www.hp.com/go/ebs

HP StorageWorks ESL9000 Series Tape Libraries

ESL9595 Extended Tape Library, 0 drive, 400 slots (card cage, Interface Mgr card, Command View license)	343378-B21
ESL9322 Extended Tape Library, 0 drive, 222 slots (card cage, Interface Mgr card, Command View license)	343377-B21
ESL9000 Ultrium 460 drive kit	330834-B21
ESL9000 Ultrium 230 drive kit	301930-B21
ESL9000 SDLT 320 drive kit	293414-B21

NOTE: Please reference the ESL9000 Series Tape Libraries QuickSpecs at http://www.hp.com/go/automation for additional information needed to create a complete solution; reference current compatibility information at http://www.hp.com/go/ebs

Options

Magneto-Optical Jukeboxes	**HP StorageWorks 9.1 GB Mid-range Optical Jukeboxes**	
	300mx, 2 drive, 32 slot jukebox	C1150M
	600mx, 4 drive, 64 slot jukebox	C1160M
	700mx, 2 drive, 76 slot jukebox	C1170M
	NOTE: Please reference the Magneto-Optical Jukebox data sheets at http://www.hp.com/go/optical for additional information needed to create a complete solution	
	HP StorageWorks 9.1 GB High-end Optical Jukeboxes	
	1200mx, 4 drive, up to 128 slots	C1104M
	1200mx, 6 drive, up to 128 slots	C1105M
	2200mx, 4 drive, up to 238 slots	C1111M
	2200mx, 6 drive, up to 238 slots	C1107M
	2200mx, 10 drive, up to 238 slots	C1110M
	NOTE: Please reference the Magneto-Optical Jukebox data sheets at http://www.hp.com/go/optical for additional information needed to create a complete solution	
HP StorageWorks Modular Smart Array 1000	HP StorageWorks Modular Smart Array 1000	201723-B22
	Modular Smart Array 1000 Controller	218231-B22
	Modular Smart Array Fibre Channel I/O Module	218960-B21
	Modular Smart Array hub 2/3	286763-B21
	HP StorageWorks Modular Smart Array 1000	201723-B22
	NOTE: Please see the StorageWorks Modular Smart Array 1000 QuickSpecs for additional options and configuration information at: http://h18000.www1.hp.com/products/quickspecs/11033_na/11033_na.HTML	

Options

Cluster Options	ProLiant Cluster HA/F200 for Modular Smart Array 1000	252409-B24
	NOTE: For additional information regarding the ProLiant Cluster for HA/F100, HA/F200 for Modular Smart Array 1000 please see the following QuickSpecs at: http://h18000.www1.hp.com/products/quickspecs/11035_na/11035_na.html	
	ProLiant Cluster HA/F500 Enhanced Kit for Enterprise Virtual Array	254623-B24
	ProLiant Cluster HA/F500 Basic Kit for Enterprise Virtual Array	313047-B23
	NOTE: For additional information regarding the HP ProLiant Cluster for ProLiant Cluster HA/F500 for Enterprise Virtual Array please see the following QuickSpecs at: http://h18000.www1.hp.com/products/quickspecs/11055_na/11055_na.html	
	NOTE: For additional information regarding the HP ProLiant Cluster for HA/F500 please see the following QuickSpecs at: http://h18000.www1.hp.com/products/quickspecs/10232_na/10232_na.html	
	HP Serviceguard for Linux ProLiant Cluster A.11.14 for Red Hat EL 2.1 (2 node license cluster kit)	305199-B22
	NOTE: Kit includes 2 licenses, documentation and an Ethernet crossover cable.	
	HP Serviceguard for Linux ProLiant Cluster (2 node license cluster kit) A.11.15	305199-B24
	NOTE: Kit includes 2 licenses, documentation and an Ethernet crossover cable.	
	HP Serviceguard for Linux (single license version for ordering flexibility and to ease ordering for larger cluster for Red Hat AS 2.1) A.11.14	307754-B22
	NOTE: Kit includes single license version and documentation.	
	HP Serviceguard for Linux (single license version for ordering flexibility and to ease ordering for larger cluster) A.11.15	307754-B24
	NOTE: Kit includes single license version and documentation.	
	NOTE: For additional information regarding the HP Serviceguard for Linux License, please see the following QuickSpecs at: http://h18000.www1.hp.com/products/quickspecs/11518_na/11518_na.html	

USB Options	USB 1.44-MB External Diskette Drive (Carbonite)	DC141B
	USB Optical Scroll Mouse (Carbonite)	DD441B
	USB Easy Access Keyboard (Carbonite/Silver)	DC168B-ABA

Options

Rack 10000 Series (Graphite Metallic)	HP S10614 (14U) Rack Cabinet - Shock Pallet	292302-B22
	HP Rack 10647 (47U) Cabinet - Pallet	245160-B21
	HP Rack 10647 (47U) Cabinet - Crated	245160-B23
	HP Rack 10642 (42U) Cabinet - Pallet	245161-B21
	HP Rack 10642 (42U) Cabinet - Shock Pallet	245161-B22
	HP Rack 10642 (42U) Cabinet - Crated	245161-B23
	HP Rack 10636 (36U) Cabinet - Pallet	245162-B21
	HP Rack 10636 (36U) Cabinet - Shock Pallet	245162-B22
	HP Rack 10636 (36U) Cabinet - Crate	245162-B23
	HP Rack 10622 (22U) Cabinet - Pallet	245163-B21
	HP Rack 10622 (22U) Cabinet - Shock Pallet	245163-B22
	HP Rack 10622 (22U) Cabinet - Crated	245163-B23
	NOTE: -B21 (pallet) used to ship empty racks shipped on a truck -B22 (shock pallet) used to ship racks with equipment installed (by custom systems, VARs and Channels) -B23 (crated) used for air shipments of empty racks Not all HP equipment is qualified to be shipped in the Rack 10000 series.	
	NOTE: Please see the Rack 10000 QuickSpecs for Technical Specifications such as height, width, depth, weight, and color: http://h18000.www1.hp.com/products/quickspecs/10995_na/10995_na.HTML	
	NOTE: For additional information regarding Rack Cabinets, please see the following URL: http://h18000.www1.hp.com/products/servers/proliantstorage/rack-options/index.html	

Rack Options for HP Rack 10000 Series	HP Rack Plinth Kit (Carbon)	251960-B21
	HP Rack Light Kit (Neon)	361589-B21
	42U Side Panel – Graphite Metallic	246099-B21
	36U Side Panel – Graphite Metallic	246102-B21
	47U Side Panel – Graphite Metallic	255486-B21
	NOTE: For additional information regarding Rack Options, please see the following URL: http://h18000.www1.hp.com/products/servers/proliantstorage/rack-options/index.html.	
	Server Console Switch 1 x 4 port (100-230 VAC)	400336-001
	IP Console Switch Box, 1 x 1 x 16	262585-B21
	IP Console Switch Box, 3 x 1 x 16	262586-B21
	CPU to Server Console Cable, 12’	110936-B21
	CPU to Server Console Cable, 3’	110936-B24
	CPU to Server Console Cable, 7’	110936-B25
	IP CAT5 Cable 3’, 4 pack	263474-B21
	IP CAT5 Cable 6’, 8 pack	263474-B22
	IP CAT5 Cable 12’, 8 pack	263474-B23
	IP CAT5 Cable 20’, 4 pack	263474-B24
	IP CAT5 Cable 40’, 1 pack	263474-B25
	TFT5600 Rack Keyboard Monitor	221546-001
	TFT7210R Rack Mounted 17" Monitor	348373-B21
	NOTE: For a complete list of Monitors please view the following URL: http://h18004.www1.hp.com/products/monitors/	
	1U Rack Keyboard & Drawer (Carbon)	257054-001
	NOTE: For additional information regarding Rack Options, please see the following URL: http://h18000.www1.hp.com/products/servers/proliantstorage/rack-options/index.html.	

Service and Support Offerings (HP Care Pack Services)

NOTE: The HP Care Pack services for ProLiant BL p-Class server blades, cover the server blade and the p-Class blade enclosure that the server blade is installed in as well as interconnects, power enclosure with power supplies and power distribution.

Hardware Services On-site Service

Next Business Day On-site Service, 5-Day x 9-Hour Coverage, 3 Years	UA203A
Next Business Day On-site Service, 5-Day x 9-Hour Coverage, 3 Years, Electronic	UA203E
4-Hour On-site Service, 5-Day x 13-Hour Coverage, 3 Years	UA204A
4-Hour On-site Service, 5-Day x 13-Hour Coverage, 3 Years, Electronic	UA204E
4-Hour On-site Service, 7-Day x 24-Hour Coverage, 3 Years	UA205A
4-Hour On-site Service, 7-Day x 24-Hour Coverage, 3 Years, Electronic	UA205E
6-Hour Call to Repair, On-site Service, 7-Day x 24-Hour Coverage, 3 Years	UA206A
6-Hour Call to Repair, On-site Service, 7-Day x 24-Hour Coverage, 3 Years, Electronic	UA206E

Installation & Start-up Services

ProLiant BL p-Class Blade Server Hardware Installation	UA219A
ProLiant BL p-Class Blade Server Hardware Installation, Electronic	UA219E
ProLiant BL p-Class Enclosure and Server Blade Hardware Installation	U4971A
ProLiant BL p-Class Enclosure and Server Blade Hardware Installation, Electronic	U4971E
Provides for the Installation and Start-up of Compaq's Rapid Deployment Pack on a Customer supplied server designated as a Deployment Server. Includes the deployment of a single server. This new server will be deployed using either one of the pre-configured scripts or an image. In addition, the service will provide for the capture and storage of the configuration of the newly deployed server and orientation on product usage. To be delivered during standard office ours, standard office days.	U5683A
Provides for the Installation and Start-up of Compaq's Rapid Deployment Pack on a Customer supplied server designated as a Deployment Server. Includes the deployment of a single server. This new server will be deployed using either one of the pre-configured scripts or an image. In addition, the service will provide for the capture and storage of the configuration of the newly deployed server and orientation on product usage. To be delivered during standard office ours, standard office days. Electronic.	U5683E

NOTE: For more information, customer/resellers can contact http://www.hp.com/hps/.

Memory

ProLiant BL30p Server Blade (all models)

Standard Memory

1024-MB PC2100 MHz Registered DDR SDRAM DIMM installed (1 x 1-GB SDRAM DIMM)

Standard Memory Replaced with Optional Memory

Up to 4096-MB of DDR SDRAM DIMM memory is available with the removal of standard memory and the installation of optional SDRAM DDR DIMM memory expansion kits.

Memory		Slot	
		1	2
Standard	1024 MB	1024 MB	
Optional	1024 MB	512 KB	512 KB
Optional	2048 MB	1024 MB	1024 MB
Maximum	4096 MB	2048 MB	2048 MB

Following are memory options available from HP:

- 4096-MB of Advanced ECC PC2100 DDR SDRAM DIMM Memory Kit (2 x 2 GB) 300682-B21
- 1024-MB of Advanced ECC PC2100 DDR SDRAM DIMM Memory Kit (1 x 1 GB) 287497-B21
- 1024-MB of Advanced ECC PC2100 DDR SDRAM DIMM Memory Kit (2 x 512 MB) 257974-B21

ProLiant BL p-Class Server Blade Enclosure with enhanced backplane components	**Dimensions**	Height	10.5 in (26.67 cm)	
		Width	17.60 in (44.70 cm)	
		Depth	28.86 in (73.30 cm)	
	Input Specifications	Rated input voltage	-43 VDC to -53 VDC	Nominal -48 VDC
		Rated input current	125 A at -48 VDC	
		Rated input Power	6000 W	
	Individual Server Blade Bay Ratings	Rated input voltage	-43 VDC to -53 VDC	Nominal -48 VDC
		Rated input current	14.6 A at -48 VDC	
		Rated input Power	700 W	
	Temperature Range	Operating	50° to 95° F (10° to 35° C)	
		Non-Operating	-22° to 140° F (-30° to 60° C)	
	Relative Humidity (non-condensing)	Operating	20% to 80%	
		Non-Operating	5% to 95%	
	Wet Bulb Temperature	Operating	82.4° F (28° C)	
		Non-Operating	101.7° F (38.7° C)	

NOTE: Operating temperature has an altitude derating of 34° F (1° C) per 1,000 ft (304.8 m). No direct sunlight. Upper operating limit is 10,000 ft (3,048 m) or 70Kpa/10.1 psia. Upper non-operating limit is 30,000 ft (9,144 m) or 30.3 KPa/4.4 psia. Storage maximum humidity of 95% is based on a maximum temperature of 113° F (45° C). Altitude maximum for storage is 70 KPa.

Operating and Performance Specifications for ProLiant BLp-Class RJ-45 Patch Panel 2 with Fiber Channel pass through	**Dimensions**	Height	10.405 in (26.43 cm)
		Width	1.535 in (3.899 cm)
		Depth	27.697 in (70.35 cm)
	Capability	IEEE 802.2, 802.3, 802.3u	
	Network Transfer Rate	10 Base-T (half-duplex)	10 Mbps
		10 Base-T (full-duplex)	20 Mbps
		100 Base-TX (half-duplex)	100 Mbps
		100 Base-TX (full-duplex)	200 Mbps
		1000 Base-TX (full-duplex)	1000 Mbps
	Fiber Channel SAN	Velio VC1070 re-timer	Auto-rate negotiate between 2G and 1G
	Connector	Network	32 RJ-45 in the back.
		Fiber Channel SAN	16 Pluggable SFP optical cages in the front
	Cable Support	10 Base-TX	Categories 3, 4, or 5 UTP (2 or 4 pair); up to 328 ft (100 m)
		100 Base-TX	Category 5 UTP (2 pair); up to 328 ft/100 m
		1000 Base-TX	Category 5E (4 pair); up to 328 ft (100 m)
		Fiber Channel	SFP optical cable
	EMI	FCC Class A	
		ICES-003 Class A	
		AS/NZS 3548 Class A	
		VCCI Class A	

NOTE: Operating temperature has an altitude derating of 34° F (1° C) per 1,000 ft (304.8 m). No direct sunlight. Upper operating limit is 10,000 ft (3,048 m) or 70Kpa/10.1 psia. Upper non-operating limit is 30,000 ft (9,144 m) or 30.3 KPa/4.4 psia. Storage maximum humidity of 95% is based on a maximum temperature of 113° F (45° C). Altitude maximum for storage is 70 KPa.

Operating and Performance Specifications for ProLiant BL p-Class RJ-45 Patch Panel	**Dimensions**	Height	10.405 in (26.43 cm)
		Width	1.535 in (3.899 cm)
		Depth	27.697 in (70.35 cm)
	Capability	IEEE 802.2, 802.3, 802.3u	
	Network Transfer Rate	10 Base-T (half-duplex)	10 Mbps
		10 Base-T (full-duplex)	20 Mbps
		100 Base-TX (half-duplex)	100 Mbps
		100 Base-TX (full-duplex)	200 Mbps
		1000 Base-TX (full-duplex)	1000 Mbps
	Connector	Network	16 RJ-45 in the back
	Cable Support	10 Base-TX	Categories 3, 4, or 5 UTP (2 or 4 pair); up to 328 ft (100 m)
		100 Base-TX	Category 5 UTP (2 pair); up to 328 ft (100 m)
		1000 Base-TX	Category 5E (4 pair); up to 328 ft (100 m)
	Power Requirements	200 mA at + 5V DC; 500 mA at -48V	
	Temperature Range	Operating	50° to 95° F (10° to 35° C)
		Non-operating	-22° to 140° F (-30° to 60° C)
	Relative Humidity (non-condensing)	Operating	20% to 80%
		Non-operating	5% to 95%
	Wet Bulb Temperature	Operating	82.4° F (28° C)
		Non-operating	101.7° F (38.7° C)

NOTE: Operating temperature has an altitude derating of 34° F (1° C) per 1,000 ft (304.8 m). No direct sunlight. Upper operating limit is 10,000 ft (3,048 m) or 70Kpa/10.1 psia. Upper non-operating limit is 30,000 ft (9,144 m) or 30.3 KPa/4.4 psia. Storage maximum humidity of 95% is based on a maximum temperature of 113° F (45° C). Altitude maximum for storage is 70 KPa.

Operating and Performance Specifications for ProLiant BL p-Class GbE Interconnect Switch	**Dimensions**	Height	10.405 in (26.43 cm)
		Width	1.535 in (3.899 cm)
		Depth	27.697 in (70.35 cm)
	Weight	11.5 lb/5.2 kg per interconnect switch	
	Performance	9.6 Gbps external port bandwidth per server blade enclosure (full duplex)	
		Forwarding rate 0.15 million pps per 10/100 port, 1.5 million pps per gigabit port, (64-byte packets)	
		Non-blocking, full-wire speed for all connections	
		Auto-MDI/MDIX, auto-negotiation and auto-sensing with full-duplex support	
	Forwarding Mode	Store and forward	
	MAC Addresses	8,191 per interconnect switch; MAC address based filtering and MAC address packet priority configuring	
	Forwarding Table Age Time	Maximum age: 1 to 1,000,000 seconds; default: 300 seconds	
	Memory	32MB Main, 6MB flash and 16MB packet buffer per interconnect switch	
	Compliance	IEEE 802.3, 802.3u, 802.3ab, 802.3x, 802.3z (F-GbE only), 802.1D, 802.1p, 802.3ac, 802.3ad (Static), and 802.1Q	
		SNMP v1 (RFC 1157) and RMON v1 (RFC 1757) groups 1, 2, 3, and 9	
		MIB-II (RFC 1213), Bridge MIB (RFC 1493), Interface Group MIB (RFC 2863), Ethernet MIB (RFC 1643), 802.1Q Extended Bridge MIB (RFC 2674), Entity MIB (RFC 2037), SNMP Trap Convention (RFC 1215), Bridge Trap (RFC 1493), Remote Monitoring Traps (RFC 1757), and HP Enterprise Switch MIBs and Environmental Traps	
		IGMP v1 (RFC 1112), IGMP v2 (RFC 2236), SNTP (RFC 1361), Telnet (RFC 854), TFTP client (RFC 783), BootP client, (RFC 2132), DHCP client, (RFC 2131) and ZModem,	

Network Transfer Rate	10 Base-T (half-duplex)	10 Mbps
	10 Base-T (full-duplex)	20 Mbps
	100 Base-TX (half-duplex)	100 Mbps
	100 Base-TX (full-duplex)	200 Mbps
	1000 Base-TX (half-duplex)	1000 Mbps
	1000 Base-TX (full-duplex)	2000 Mbps
	1000 Base-SX (full-duplex)	2000 Mbps
Connector	12 RJ-45, 2 DB-9 (C-GbE Interconnect Kit) 4 LC fiber, 8 RJ-45, 2 DB-9 (F-GbE Interconnect Kit)	
EMI	FCC Class A	
	ICES-003 Class A	
	AS/NZS 3548 Class A	
	VCCI Class A	
Safety	UL/CUL Listed Accessory	
	CE	
Power Requirements	-48VDC: 1050 mA, 50 W maximum (per interconnect switch)	
Temperature R range	Operating	50° to 95° F (10° to 35° C)
	Non-operating	-22° to 140° F (-30° to 60° C)
Relative Humidity (non-condensing)	Operating	20% to 80%
	Non-operating	5% to 95%
Wet Bulb Temperature	Operating	82.4° F (28° C)
	Non-operating	101.7° F (38.7° C)

NOTE: Operating temperature has an altitude derating of 34° F (1° C) per 1,000 ft (304.8 m). No direct sunlight. Upper operating limit is 10,000 ft (3,048 m) or 70Kpa/10.1 psia. Upper non-operating limit is 30,000 ft (9,144 m) or 30.3 KPa/4.4 psia. Storage maximum humidity of 95% is based on a maximum temperature of 113° F (45° C). Altitude maximum for storage is 70 KPa.

Operating and Performance Specifications for ProLiant BL p-Class GbE2 Interconnect Switch	**Dimensions**	Height	10.405 in (26.43 cm)
		Width	1.535 in (3.899 cm)
		Depth	27.697 in (70.35 cm)
	Weight	12.0 lb/5.4 kg per interconnect switch	
	Performance	24 Gbps External port bandwidth per server blade enclosure (full duplex)	
		Forwarding rate 1.5 million pps per gigabit port (64-byte packets)	
		Auto-MDI/MDIX, auto-negotiation and auto-sensing with full-duplex support	
	Forwarding Mode	Store and forward	
	MAC Addresses	2,048 per interconnect switch	
	Forwarding Table Age Time	Maximum age: 1 to 65535 seconds; default: 300 seconds	
	Memory	128MB Main, 32MB flash and 2MB packet buffer per interconnect switch	
	Compliance	IEEE 802.3, 802.3u, 802.3ab, 802.3x, 802.3z (F-GbE2 only), 802.1D, 802.3ac, 802.3ad (Static), and 802.1Q	
		SNMP v1 (RFC 1157), MIB-II (RFC 1213), Bridge MIB (RFC 1493), Interface Group MIB (RFC 2863), Ethernet MIB (RFC 1643), 802.1Q Extended Bridge MIB , Entity MIB (RFC 2037), RADIUS Authentication MIB, 802.3-2002 MIB, SNMP Trap Convention (RFC 1215), Bridge Trap (RFC 1493), Remote Monitoring Traps (RFC 1757) and HP Enterprise Switch MIBs and Environmental Traps	
		RADIUS (RFC 2138), Telnet (RFC 854), TFTP client (RFC 783), SSH v1.5, SCP v1.5, NTP v2 (RFC 1119), BootP client (RFC 2132), and XModem	
	Network Transfer Rate	10 Base-T (half-duplex)	10 Mbps
		10 Base-T (full-duplex)	20 Mbps
		100 Base-TX (half-duplex)	100 Mbps
		100 Base-TX (full-duplex)	200 Mbps
		1000 Base-TX (half-duplex)	1000 Mbps
		1000 Base-TX (full-duplex)	2000 Mbps
		1000 Base-SX (full-duplex)	2000 Mbps
	Connector	12 RJ-45, 2 DB-9 (C-GbE2 Interconnect Kit) 8 LC fiber, 4 RJ-45, 2 DB-9 (F-GbE2 Interconnect Kit)	
	EMI	FCC Class A	
		ICES-003 Class A	
		AS/NZS 3548 Class A	
		VCCI Class A	
	Safety	UL/CUL Listed Accessory	
		CE	
	Power Requirements	48VDC: 2040 mA, 98 W maximum (per interconnect switch without GbE2 Storage Connectivity Kit) 48VDC: 2355 mA, 113 W maximum (per interconnect switch with GbE2 Storage Connectivity Kit)	
	Temperature Range	Operating	50° to 95° F (10° to 35° C)
		Non-operating	-22° to 140° F (-30° to 60° C)
	Relative Humidity (non-condensing)	Operating	20% to 80%
		Non-operating	5% to 95%
	Wet Bulb Temperature	Operating	82.4° F (28° C)
		Non-operating	101.7° F (38.7° C)

NOTE: Operating temperature has an altitude derating of 34° F/1° C per 1,000 ft/304.8 m. No direct sunlight. Upper operating limit is 10,000 ft/3,048 m or 70Kpa/10.1 psia. Upper non-operating limit is 30,000 ft/9,144 m or 30.3 KPa/4.4 psia. Storage maximum humidity of 95% is based on a maximum temperature of 113° F/45° C. Altitude maximum for storage is 70 KPa.

			Single-Phase Model	3-Phase Model
Operating and Performance Specifications for ProLiant BL p-Class Power Enclosures	**Dimensions**	Height	5.25 in (13.34 cm)	5.25 in (13.34 cm)
		Width	27.15 in (68.96 cm)	27.15 in (68.96 cm)
		Depth	17.60 in (44.7 cm)	17.60 in (44.7 cm)
	Weights	No Hot-Plug Power Supplies	47.5 lb (21.55 kg)	47.5 lb (21.55 kg)
		All Hot-Plug Power Supplies	99.5 lb (45.13 kg)	125.5 lb (56.93 kg)
	Input Requirements	Rated input voltage	200 VAC to 240 VAC	200 VAC to 240 VAC line to line
		Rated input frequency	50 Hz to 60 Hz	50 Hz to 60 Hz
		Rated input current per side	24A	24A per phase
		Rated input power per side	5760 W	9976 W
		Power cord	1 NEMA L6-30P per side	1 NEMA L15-30 per side
	Output Voltage Specifications	Rated output voltage	-48.8 VDC to -54 VDC	-48.8 VDC to -54 VDC
		Rated output current	99A	170A
		Rated output power	4298 W	8310 W
		Nominal power	4158 W at 208 VAC	7202 W at 208 VAC
	Ambient Temperature Range (See **NOTE**)	Operating	50° to 95° F (10° to 35° C)	50° to 95° F (10° to 35° C)
		Shipping	-22° to 140° F (-30° to 60° C)	-22° to 140° F (-30° to 60° C)
	Relative humidity, non-condensing (See **NOTE**)	Operating	20% to 80%	20% to 80%
		Non-operating	5% to 95%	5% to 95%
	Wet Bulb Temperature	Operating	82.4° F (28° C)	82.4° F (28° C)
		Non-operating	101.7° F (38.7° C)	101.7° F (38.7° C)

NOTE: Operating temperature has an altitude derating of 34° F (1° C) per 1,000 ft (304.8 m). No direct sunlight. Upper operating limit is 10,000 ft (3,048 m) or 70Kpa/10.1 psia. Upper non-operating limit is 30,000 ft (9,144 m) or 30.3 KPa/4.4 psia. Storage maximum humidity of 95% is based on a maximum temperature of 113° F (45° C). Altitude maximum for storage is 70 KPa.

Operating and Performance Specifications for ProLiant BL p-Class Power Distribution Devices

	Power Bus Box	Mini Bus Bar	Scalable Bus Bar
Power Enclosures or facility DC feeds Supported (3U each)	1	1 or 2	1 or 2
Server blade enclosures supported (6U each)	1	up to 3	up to 5
Total rack height of supported enclosures	9U	24U	36U
Dimensions			
Height	5.1 in (12.95 cm)	19.45 in (49.40 cm)	48.57 in (123.37 cm)
Width	3.6 in (9.14 cm) each	19.74 in (50.14 cm)	19.74 in (50.14 cm)
Depth	3.25 in (8.26 cm)	2.2 in (5.59 cm)	2.2 in (5.59 cm)
Weight	3.62 lb (1.64 kg)	13.2 lb (5.9 kg)	26 lb (11.79 kg)
Rated Operating Voltage	-43.2 VDC to -54 VDC	-43.2 VDC to -54 VDC	-43.2 VDC to -54 VDC
Max Total Power Supported	3000 W	9000 W	15000 W
Total Max Input Current At Minimum Voltage	69.44 A at -43.2VDC	208.32 A at -43.2 VDC	347.2 A at -43.2 VDC (equivalent of 175A per feed)
Total Max Input Current At Nominal Voltage	62.5 A at -48VDC	187.5 A at -48 VDC	312.5 A at -48 VDC (equivalent of 175A per feed)
Max Current Per Power Feed	70A	70A	210A
Max Local Ambient Temperature	149° F (65° C)	149° F (65° C)	149° F (65° C)

NOTE: All systems support redundant A & B feeds. Scalable bus bar supports dual A and dual B feeds.

Operating and Performance Specifications for Facility DC	**Voltage**	Nominal input voltage	-48 VDC
		Operating voltage range	-48VDC ± 10% or -43.2 VDC to -52.8 VDC
		Max Input voltage slew rate	0.5V/uS
		Redundant feed voltages* (A & B)	*A and B feeds must differ by no more than 5VDC during steady state operation
		Ripple/Noise	480 mV PARD**
		Overshoot	Must remain within regulation limits on all feeds during startup or shutdown
		Voltage transients	Must not exceed -60 VDC
	Current	Max steady state input current	62.5A per server blade enclosure installed at -48VDC
		Max steady state current per feed/total	
		Power bus boxes	70 A/70A
		Mini bus bars	210 A/210A
		Scalable bus bars	210 A/350A or equivalent of 175A per feed*
	In-rush current	Must support up to 2X the maximum operating current per server blade enclosure (125 A) for up to 1.0 mS	
	Input over-current	Customer provided fusing for facility DC feeds that protects the system from catastrophic over-current within 20 uS. Fuse should sustain all in-rush and operating currents.	
	Max Input Current Slew Rate	1A/uS	
	Max Rated Power	3000W per server blade enclosure	
	Connections and Cables	HP provided facility DC cable connection kit: ● The facility DC connection kit supports the connection of up to four -48VDC, RETURN pairs and ground The power cable assemblies consist of 1/0AWG, color-coded, flexible cable rated at 105° C, terminated with bus mating connectors at one end and unterminated at the other end. The cable length provided enables the customer to route to a fuse panel within or adjacent to the rack.	

NOTE: *All systems support redundant A and B feeds. Scalable bus bars support dual A and dual B feeds.

** Periodic and random noise (PARD). Maximum allowable peak-to-peak ripple and noise (as measured at the load on any output channel). The ripple and noise is measured over a 20 Hz to 100 MHz frequency band. A resistive load (non-electronic) is used for this measurement. Each output is by-passed to return by a 10uF tantalum capacitor with an ESR less than 100 milli-Ohms in parallel with a 0.47 uF ceramic capacitor, at the point of load. The load cable is 12 feet of twisted wire capable of carrying the current. The printed wiring board assembly is installed in its enclosure for this measurement, or the measurement leads are properly shielded with Earth grounds applied to the insert.

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